Adaptec SCSI RAID 2120S/2200S

Installation Guide

adaptec®

Contents

1

Introduction

In this Chapter

Read this First

Before you begin installing your new Adaptec SCSI RAID controller, read this chapter. This chapter is an important guide to the rest of the documentation and provides a summary of the installation process.

System Requirements

The following system requirements are discussed:

■ Storage requirements for drivers and software

■ Motherboard compatibility

■ SCSI requirements

Storage Requirements for Drivers and Software

Adaptec storage management software and device drivers will require disk space of up to 20 MB.

✓ **Note:** This information is provided as a guide for allocating resources on your system. Space requirements may vary in subsequent releases. Allocate more room on your hard disk drive if in doubt. See page 1-13 for information about the meaning of Notes.

A mouse and SVGA color monitor using a resolution of at least 800 x 600 with 16-bit color are also required.

Motherboard Compatibility

The Adaptec controller requires a motherboard BIOS that:

■ Complies with the *PCI Local Bus Specification, Revision 2.2* and higher.

■ Supports multifunction devices where one of the devices is a PCI bridge.

■ Provides large memory-mapped address ranges.

Refer to the Readme file on the *Adaptec SCSI RAID Installation CD* for information about motherboard compatibility and notable comments about some motherboards that Adaptec has tested with the Adaptec SCSI RAID controller.

SCSI Requirements

While the Adaptec SCSI RAID 2120S/2200S are designed to work with Ultra320 SCSI hard disk drives, they will operate, at a reduced level of performance, with all Ultra 2 or higher SCSI devices. Use of SCSI devices older than Ultra 2 is not suggested. Older devices will adversely affect other devices attached to the same channel and could cause a working Ultra 320 channel to become nonfunctional, due to distance contraints inherent in using some of these older devices.

More details about configuring and using SCSI devices are available in *Configuring SCSI Devices on page 2-1*.

Kit Contents

Your Adaptec controller kit includes:

■ Adaptec SCSI RAID 2120S/2200S controller with 1 internal LVD SCSI cable having a multimode terminator.

■ Low-profile bracket.

■ Warranty card.

■ *Adaptec SCSI RAID 2120S/2200S CD;* a bootable CD that includes RAID management software, drivers, and documentation.

Adaptec SCSI RAID Controller Features

Adaptec SCSI RAID 2120S/2200S features are summarized in the table below:

	Adaptec 2120S	Adaptec 2200S
PCI bus width	64-bit	64-bit
PCI bus speed	66 MHz	66 MHz
Cache, standard	64 MB	64 MB
Channels	1	2
Devices per channel	15[1]	15[1]
Total devices	15	30
Connectors, internal	1 high density	2 high density
Connectors, external	1 VHDCI[2]	2 VHDCI[2]
RAID 0, 1, 5, 10, 50, JBOD	Yes	Yes
Simple Volumes	Yes	Yes
Spanned Volumes	Yes	Yes
RAID Volumes	Yes	Yes
Hot Spare drives	Yes	Yes
Hot swap drives	Yes	Yes
Audible alarm	Yes	Yes
Battery module option	Yes	Yes

[1] SCSI RAID controllers support Ultra320 through Ultra 2 hard disk drives and non-hard-disk-drive devices, such as CD and tape drives.

[2] VHDCI (Very High Density Connector Interface).

Adaptec SCSI RAID controllers support:

- RAID levels 0, 1, 5, multilevel 10 and 50, and joining of available space from connected drives into a logical volume.

- Cache memory with Error Correcting Code (ECC).

- *PCI Local Bus Specification, Revision 2.2,* with PCI clock speeds up to 66 MHz.

- Microsoft Windows® 2000, Windows® NT, Windows® XP, Novell NetWare, SCO OpenServer, OpenUNIX, Red Hat Linux, and SuSE Linux.

- Operating system independent configuration and RAID creation using Adaptec RAID Configuration (ARC).

- Local and remote configuration, array status, and I/O monitoring using Adaptec Storage Manager - Browser Edition.

- Intelligent Hot Spares that automatically replace failed drives. Hot Spares may be assigned to a specific array or globally. In the event of a drive failure of a component of a redundant array, that component will be rebuilt automatically onto a Hot Spare.

- Flash ROM for easy upgrades of controller firmware.

- Event logging and event mail notification.

- RAID Level migration wherein a RAID may be changed from one level to another without compromising the data.

- *Novell NetWare, Windows 2000, Windows NT, and Windows XP only*—Online Capacity Expansion (OCE) and extension during normal operation on RAID 0, RAID 10, RAID 5, or RAID 50 arrays with the NTFS file system. Refer to the *Adaptec SCSI RAID Software User's Guide* for specific information.

- Ultra 2 and above SCSI drives (including hard disk, tape, CD-ROM, CD-RW, and Magneto-Optical drives) and jukeboxes. See *Mixing Devices on a Channel on page 2-3* for more details.

- Multimode termination.

- SAF-TE (SCSI Accessed Fault-Tolerant Enclosure) and SES (SCSI Enclosure Services) enclosure support.

About the Documentation

The complete documentation set for Adaptec SCSI RAID controllers is supplied on the CD as electronically available Portable Document Format (pdf) files. The set includes:

■ *Installation Guide* (this book)—Contains information that helps you to configure and install your Adaptec SCSI RAID controller and attached devices.

■ *Adaptec SCSI RAID Software User's Guide* —Describes how to use ARC, Adaptec Storage Manager -Browser Edition software, and the Command Line Interface utility (CLI).

■ *Adaptec SCSI RAID Software Reference Guide* --- An in-depth coverage of the commands available in the CLI, ACU DOS, and AFU.

Adaptec Storage Manager-Browser Edition provides online help for creating and managing RAIDs, including topical and pop-up help displays. The documents listed above are included on the *Adaptec SCSI RAID Installation CD*. Refer to page 1-9 for details.

Using the Adaptec SCSI RAID Installation CD

The *Adaptec SCSI RAID Installation CD* contains the Adaptec Storage Manager-Browser Edition Software, ACU, CLI, device drivers, and documentation needed to install and support your Adaptec SCSI RAID Controller.

The *Adaptec RAID Installation CD* is a bootable disk, which means you can use it to start a computer that has no operating system and configure an array, provided your computer recognizes bootable CDs.

Note: If your computer is not set for bootable CD support, change the system BIOS so that the CD drive is used as a boot device.
See page 1-13 for information about the meaning of Notes.

If your computer has no operating system, the *Adaptec RAID Installation CD* may be used to boot your computer, display a user interface, and provide access to the following options:

■ **Launch RAID configuration utility...**—Starts Adaptec Storage Manager-Browser Edition, which enables you to configure your RAID and build disk arrays.

■ **Create driver disk(s)...**—Enables you to create a driver disk for any supported operating system.

■ **View documentation...**—Displays a list of the available product documents and the Readme file with the latest release notes. Select a document name and click **OK** to view the information.

■ **Start a command shell for UNIX or Linux users**—This lets you mount an additional device or enter other system commands that might be required during the installation.

■ **Reboot**—Restarts the computer system. Before restarting, the system will attempt to eject the CD. Please remove the CD.

If your computer is booted to a Windows operating system and you insert the *Adaptec SCSI RAID Installation CD* in the drive, your computer automatically reads the CD if it is set up to do so. If your computer *does not* automatically read the CD, you can prompt it to read the CD by clicking on **autorun.exe** from the root directory, which presents the following options:

■ **Install Adaptec Storage Manager - Browser Edition**—Installs Adaptec Storage Manager-Browser Edition software. For an overview of the storage management software options, refer to *Adaptec Storage Manager Software Overview on page 1-12*.

■ **Install Adobe Acrobat Reader**—Installs Adobe Acrobat Reader for Windows to let you view the Adaptec documentation in PDF format. Versions of Acrobat Reader for other platforms are also included, refer to *Installing the Adobe Acrobat Reader on page 1-10*.

■ **View Release Notes**—Displays release notes containing the latest information for Adaptec SCSI RAID products and software.

- **View Documentation**---Provides a quick means to access the electronically stored documents, in PDF form, that are included on the CD.

- **Create Driver Diskette**---Enables you to create a driver disk for any supported operating system.

Files and Folders

If your installation process requires you to directly access files on the *Adaptec SCSI RAID Installation CD*, you can save time by limiting your browsing to the following files and folders, available at the root level:

- **Autorun executable**—In Windows, click on **autorun.exe** if your computer does not automatically execute it when you insert the CD in the drive.

- **Readme text file**—Contains additional technical information about device compatibility, operating system support, and drivers.

- **DOCS folder**—Contains the user documentation PDF files.

- **PACKAGES folder (and subfolders)**—Contains the management software and device drivers.

- **SOURCES Folder (and subfolders)**—Contains driver source files and other components developed under the GNU General Public License (GPL) agreement.

Product Documentation on CD

The *Adaptec SCSI RAID Installation CD* contains the following documents:

Subject	CD Location
Adaptec SCSI RAID 2120S/2200S Installation Guide	/docs/RAID Install Gd 513217vAA.pdf
Adaptec SCSI RAID Software User's Guide	/docs/RAID SW Gd 513218vAA.pdf
Adaptec SCSI RAID Software Reference Guide	/docs/RAID SW Ref 513399vAA.pdf

You can view these documents only if you have Acrobat Reader or Viewer installed on your computer. For details, refer to *Installing the Adobe Acrobat Reader on page 1-10*.

You can download these documents from the Adaptec Web site at http://www.adaptec.com. The documents available from the Adaptec Web site may be more recent versions than those on the CD.

Errata and Release Notes

Before beginning your installation, review the errata and release notes associated with the Adaptec controller, software, and documentation. To read this information, select **Release Notes** from the View Documentation list or open the Readme file in the root directory of the CD using a text editor.

Updates to the Release notes for this product may be posted on the Adaptec web pages at www.adaptec.com.

Installing the Adobe Acrobat Reader

Both Adobe Acrobat Reader and Viewer are provided on the *Adaptec SCSI RAID Installation CD*. These applications enable you to view the Portable Document Format (PDF) files on the *Adaptec SCSI RAID Installation CD*. Acrobat Reader is also available from Adobe as a free download. For details, go to http://www.adobe.com.

How you use Reader or Viewer varies by operating system, as described below:

■ **Windows**—To install Acrobat Reader, choose the appropriate option. If Autorun is disabled, click Autorun on the root to enter.

■ **UNIX**—Use Acrobat Viewer because Reader is not available for all operating systems. Your system must have Java Runtime Environment 1.1.7B dated April 11, 2000 or later. The Viewer is located on the *Adaptec SCSI RAID Installation CD* at <mount-point>/Acrobat_Reader.

Note: You can download Java Virtual Machine (JVM) from http://java.sun.com for all supported platforms.
See page 1-13 for information about the meaning of Notes.

■ **NetWare**—Acrobat Reader and Viewer are not available for this operating system or any DOS environment. You need to use a computer that supports Acrobat Reader or Acrobat Viewer.

■ **Linux**—Acrobat Reader is located on the *Adaptec SCSI RAID Installation CD* at *<CD mount location>*/packages/Linux/RedHat/apps/adobe. Be sure to use the full path when viewing this location. If the path gets truncated, you may not see the correct location.

Overview of the Installation Process

The following steps provide an overview of the process of installing and setting up the controller and configuring the RAID:

1   Read this entire chapter.

2   Verify that your motherboard is compatible with the controller. For details, refer to *Motherboard Compatibility on page 1-2*.

3   Gain familiarity with the features and functions of the *Adaptec SCSI RAID Installation CD*. Refer to page 1-6 for details.

4   Install and configure your Adaptec SCSI RAID controller and hard drives according to the instructions in Chapter 2. If you are upgrading an existing system and will be using existing SCSI drives as part of your array(s), back up all data.

5   If you will be starting your system from an array (sometimes referred to as 'booting' the system), use the Adaptec RAID Configuration utility (ARC) to set up the boot array. Another approach would be to start your system using the *Adaptec SCSI RAID Installation CD*, and create any arrays needed. Refer to *Creating a RAID 5 Without an Operating System on page 2-9* for details, or review the information in the *Adaptec SCSI RAID Software User's Guide*.

6   Install the controller driver according to the instructions in Chapter 3. If you are building a new system, installing the driver involves installing the operating system, too.

Chapter 3 presents numerous scenarios for installing the driver. Identify the scenario that applies to your system before proceeding.

7   *Optional*—Install Adobe Acrobat Reader if you do not have Acrobat installed on your computer. If you need to upgrade Acrobat, do so now. You need Acrobat to view and print the documentation on the *Adaptec SCSI RAID Installation CD*.

8   Install Adaptec Storage Manager-Browser Edition on your system. For an overview, refer to *Adaptec Storage Manager Software Overview on page 1-12*. Installation procedures are described in Chapter 4.

Adaptec Storage Manager Software Overview

Your Adaptec SCSI RAID controller includes the following software tools to manage your storage subsystem:

■ **Adaptec Storage Manager-Browser Edition**—Browser based storage management software that provides all of the creation, management, data logging, messaging, and remote control needed to manage arrays on your network. The Browser Edition of Adaptec Storage Manager provides a great deal of flexibility in how it may be set up and used (see *Software Components on page 4-2* for more details). Arrays may be managed on systems using the following operating systems:

  ■ Windows 2000, Windows NT, Windows XP

  ■ SuSE Linux 7.3 and 8.0, Red Hat Linux 7.2 and 7.3

  ■ SCO UnixWare 7 and OpenServer 5

  ■ Open Unix 8

  ■ Novell NetWare 5.x and 6.x

  The Web server portion of Adaptec Storage Manager-Browser Edition may be installed on:

  ■ Windows 2000, Windows NT, Windows XP

  ■ SuSE Linux 7.3 and 8.0, Red Hat Linux 7.2 and 7.3

  The Client portion of Adaptec Storage Manager-Browser Edition may be set-up on any system using Internet Explorer 5.0 or higher or Netscape 6.0 and higher.

■ **Command Line Interface utility (CLI)**—Provides the same functions as Adaptec Storage Manager in environments where a Graphical User Interface (GUI) is not available or desired. It is also scriptable, making it an invaluable companion RAID configuration utility in environments where many similarly-configured RAID subsystems must be replicated quickly. For details, refer to the *Adaptec SCSI RAID Software User's Guide*.

- **Adaptec RAID Configuration utility (ARC)**— Part of the controller's built-in BIOS code. You can start ARC by pressing **Ctrl+A** during BIOS startup. For details, refer to *Determining the Booting Controller on page 2-7* or see the related chapter in the *Adaptec SCSI RAID Software User's Guide*.

- **Array Configuration Utility (ACU)**--- A DOS application used to create, configure, and manage arrays.

Safety Information

Any device that uses electricity must be treated with caution. To ensure general safety, follow these guidelines:

- Keep your work area and the computer clean and clear of debris. Eliminate hazards such as spills or bad wiring.

- Before opening the system cabinet, unplug the power cord.

Notes, Cautions, and Warnings

This *Installation Guide* uses notes, cautions, and warnings that emphasize important information, as described below:

Note: Emphasizes important information that, if ignored, would not result in injury, property damage, or data loss.

Caution: Emphasizes important information that, if ignored, could cause equipment failure or loss of data.

Warning: Indicates a hazard that could cause injury or property damage.

Electrostatic Discharge

Electrostatic discharge (ESD) is a natural by-product of human activity. ESD is transmitted by materials that retain and accumulate electrical charges.

> ⚠️ **Caution:** ESD can damage electronic components when they are improperly handled and can result in complete or intermittent failures. Always follow ESD-prevention procedures when removing and replacing components.

To prevent ESD damage, follow these guidelines:

■ Always use an ESD wrist or ankle strap and ensure that it makes skin contact.

■ Connect the equipment end of the strap to an unpainted metal chassis surface.

■ If no wrist strap is available, ground yourself by touching the metal chassis.

■ When installing or removing a component, use any available ejector levers or captive installation screws to properly seat the bus connectors in the backplane or card slot. These devices prevent accidental removal, provide proper grounding for the system, and help to ensure that bus connectors are properly seated.

■ Handle adapter cards by available handles or edges only. Avoid touching the printed circuit boards or connectors.

■ Avoid contact between printed circuit boards and clothing. The wrist strap only protects components from ESD voltages on the body; ESD voltages on clothing can still cause damage.

■ Place a removed component board-side-up on an antistatic surface or in an approved antistatic container.

■ If you plan to return the component to Adaptec, immediately place it in a static-shielding container.

2

Installing The Controller

In this Chapter

Configuring SCSI Devices

When configuring devices for Adaptec SCSI RAID 2120S/2200S controllers, you may need to:

■ Decide how to position drives on the SCSI channel.

■ Select cables.

■ Provide adapters for devices that need them.

■ Configure termination on devices that offer termination, as required.

■ Set the controller for starting or booting the system.

■ Set the SCSI IDs.

In general, drives used in a RAID configuration should be as alike as possible in terms of capacity and performance.

LVD and SE Devices

Use of Ultra 2 or later drives is recommended. Ultra 2 was the first SCSI specification using Low Voltage Differential (LVD) signaling, use of LVD devices is recommended for creating arrays. Single-ended (SE) devices function with the Adaptec SCSI RAID 2120S/2200S controllers. If attached, however, an SE SCSI device will cause the channel to slow to Ultra SCSI speed (20 MHz) or less for all devices. Other limitations and configuration challenges may ensue from use of SE devices.

When using the controller to create arrays, keep all of your high performance devices on the same channel. See *Mixing Devices on a Channel* later in this chapter for more information.

Narrow and Wide SCSI Devices

You can attach either narrow (8-bit) or wide (16-bit) SCSI devices to your Adaptec SCSI controller. If using narrow and wide devices on the same wide cable, use a cable with an attached terminator or put one of the wide devices at the end of the cable. This ensures that the 16-bit signals are correctly terminated. See the following section for more details and diagrams that may be helpful.

> **Note:** To ensure proper termination, use the supplied cable or one like it, having a multimode terminator built in, and disable termination on all attached devices to that cable. LVD devices do not offer termination and must be used with a cable of this type.

Wide devices allow data to be transferred at twice the rate of narrow devices of the same rating. The wide channel is backward compatible with narrow devices, allowing both types of SCSI devices to be used with the same controller. The narrow interface is still used with some SCSI devices, such as tape and CD-ROM drives.

Mixing Devices on a Channel

There are numerous types of SCSI devices on the market, and it may be tempting to mix state-of-the-art devices with others that may be available. While most combinations will work, performance will be degraded. Adaptec Ultra320 RAID controllers are meant to be used to construct arrays using Ultra320 drives and Ultra320 cables. Mixing any other type of device or cable with Ultra320 devices may reduce the performance on that channel.

The Adaptec SCSI RAID controllers may be used in LVD mode or SE mode. To operate at their maximum designed rate, LVD devices must be connected only with LVD devices on a channel. The cable used with LVD devices must supply the termination, since LVD devices do not provide termination. LVD devices will automatically connect as SE if any SE only device is connected to that channel.

> ⚠ **Caution:** If you have older SCSI-2 devices with a High Voltage Differential (HVD) interface, *DO NOT USE THEM* with the Adaptec SCSI RAID controller. Doing so will damage the controller.

Use of Ultra 2 devices will reduce the performance dramatically! Other LVD devices attached typically won't impact the performance of Ultra320 devices on the same channel, although the maximum transfer rate of each LVD device will be limited to that device's native design speed.

If SCSI devices other than LVD interfaced hard disk drives (SE) have to be attached to your system, they are best connected either to a separate SCSI controller, or a channel of the RAID controller not used by any arrays. This is due to the SE devices limiting the transfer rate of all devices attached to that channel. SE specifications allow for maximum connecting cable lengths of either 1.5 m or 3 m, depending on transfer speed. This alone could make the addition of an SE device to a working system not function if the system was operating in LVD mode and using longer cable lengths as allowed by later versions of SCSI.

SCSI Cables

Adaptec recommends using Ultra 320 SCSI devices and good quality (or better) LVD SCSI cables designed and rated for Ultra 320 use. These can be purchased from Adaptec at www.adaptec.com. Using cables not rated for Ultra 320 operation may adversely impact the performance of your system.

SCSI Device IDs

The SCSI specification allows up to 16 devices (one has to be the controller) to be connected to a SCSI channel. Narrow SCSI devices only support a maximum of 8 devices, and may be attached using appropriate convertors for each device. Be aware that narrow devices are almost always SE.

All SCSI devices, including the controller, must be assigned a unique SCSI ID. SCSI IDs, which are typically set using jumpers or switches on peripheral devices, can be assigned any number from 0 to 7 for 8-bit SCSI devices or 0 to 15 for Wide SCSI devices.

Since devices used with the Adaptec SCSI RAID controller should be LVD, the SCSI ID of each device will be a unique number between 0 and 15. The Adaptec SCSI RAID controller is set to ID 7 by default (most SCSI controllers use ID 7). SCSI IDs can only be duplicated on the same controller if the devices using the same ID are not attached to the same controller channel.

SCSI enclosures, using SCSI drives with 80 pin SCA connectors, typically assign the drive ID automatically when the drive is inserted. No setting of the ID is necessary when using drives with such an enclosure unless your enclosure requires it. Consult the enclosure documentation if you need assistance.

The Adaptec SCSI RAID controller ID can be changed to any ID from 0 through 7. Use ARC to change the controller SCSI ID.

Note: Unless changing the controller ID is essential to system operation, it should be set to SCSI ID 7.

SCSI Termination

Proper termination of channels used with SCSI devices is critical in having the system work properly. The basics of termination are:

■ Use SCSI cables certified for Ultra320 operation to allow the system to work at full speed.

> **Note:** The cable that came with your Adaptec SCSI RAID 2120S/2200S controller has a built-in multimode terminator on one end. This is meant to be located at the opposite end of the cable from the attachment to the controller. None of the devices attached to this cable should be terminated. Like this cable, SCSI cables meant for Ultra320 have multimode termination.

■ Enable termination on the physical end of a SCSI cable opposite its connection to the controller (see the note above and the following figure). If the controller is at one end of the SCSI cable, leave the controller's termination set to **On** for that channel. Turn the controller's termination setting **Off** only if both internal and external cables and terminators are attached to that channel. Any cables attached to a channel that doesn't have any devices or terminators attached should be disconnected from the controller prior to starting the system.

■ If you are using multiple SCSI channels on a single controller, as is possible on the Adaptec SCSI RAID 2200S, terminate each channel separately.

SCSI termination for Adaptec SCSI RAID controllers is configured through ARC. The controller has two possible termination settings:

Setting	Function
Auto (Default)	Used for most cabling conditions.
Disabled	Disables controller termination unconditionally.

The following figure shows various SCSI cabling examples, note that all channels are shown as wide only.

Internal Wide SCSI

Internal Wide SCSI

External Wide SCSI

External Wide SCSI
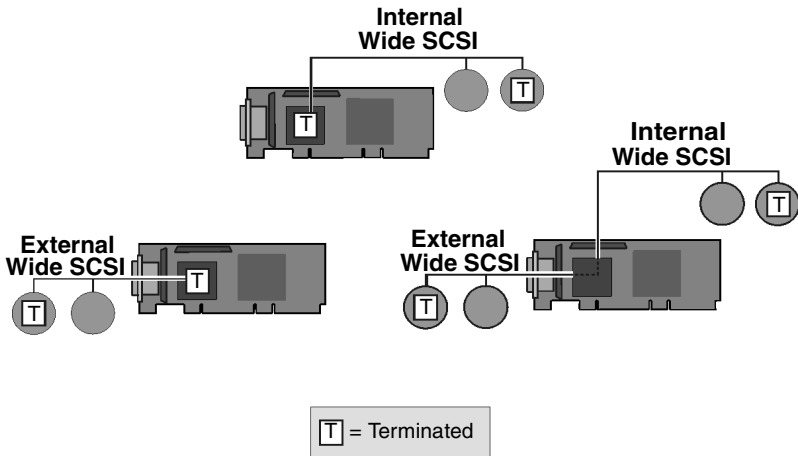
T = Terminated

If using cables with attached mutimode terminators, as in the cable supplied, configure controller termination to *auto* unless both internal and external connectors are being used on that channel.

If narrow devices are being used, attach them using wide to narrow adapters. If SE or other slower devices are being used, keep them on the same channel, along with any narrow devices.

Terminate your SCSI devices as shown in the examples, ensuring that the cables are terminated, or the device at the end of a cable is terminated, and the devices in the middle are not terminated. If only one cable is attached, then one end is the controller, which must have its termination set to **auto**.

> **Note:** Each channel being used on a multichannel RAID adapter must be terminated properly for its configuration.

Installing the Controller

To install the controller in the system cabinet:

1 If needed for your system, install the low-profile bracket supplied in the kit that came with the controller.

2 Connect the computer's disk activity LED cable to the appropriate connector on the controller. See *Appendix A* for the location of this connector for your controller model.

Ensure that the positive lead of the LED cable, usually a red wire or a wire marked with a red stripe, is attached to pin 1 and the negative lead, usually a black wire, is attached to pin 2.

3 Connect any internal drive cables now.

4 Install the controller in an available 32- or 64-bit PCI bus slot and secure the controller bracket to the host system cabinet with the screw provided with the system.

5 Connect any external cables to the controller.

Determining the Booting Controller

The Adaptec SCSI RAID 2120S/2200S are shipped configured to be a bootable controller. The default setting of the controller and system BIOS Setup usually will allow you to install and boot from either a hard disk drive connected to the motherboard, or from a drive or array connected to the controller.

If you already have an operating system installed on a hard disk drive connected to the motherboard and you want to boot a second operating system from the Adaptec SCSI RAID 2120S/2200S will you have to modify the system's BIOS settings.

In this case, enter the system BIOS Setup and look for the hard disk boot sequence. Move the Adaptec SCSI RAID 2120S/2200S to the top of the list.

Controller Setup

On the controller setup you need to enable the following:

1   Enter the ARC utility by pressing **Ctrl+A** when the *Adaptec* message appears.

2   Use the *Disk Utilities* menu item to examine the drives showing as available to the system. If any seem to be missing, power the system down and inspect the hardware connections.

3   Use the *SCSISelect Utility* menu item to inspect the hardware configuration of the controller and the drives.

Verify that all peripheral devices and controllers are shown. If any devices are missing from the display, exit the utility and check your hardware connections.

4   If the boot device will be an array, create that array now. You can create or modify other arrays later. See *Creating a RAID 5 Without an Operating System on page 2-9* for more details.

5   Exit the Configuration Utility.

The system begins building newly created or modified arrays. For large arrays using the Clear option, this process may take several hours. When using the Build With Verify option, you can perform other activities on the system while the build operation continues. Perfromance of the array will be decreased until the initialization is complete.

Use of the Quick (Quick Init) option will allow use of the new array as soon as it has been created, but write performance on RAID 5s and RAID 50s will be reduced. This will be true until a Verify with Fix is performed on that array.

When the RAID has finished building proceed to install the operating system to the bootable array.

Creating a RAID 5 Without an Operating System

This part of the Installation Guide provides a quick installation of a RAID 5 system with the minimum three drives attached to channel 0 of an Adaptec SCSI RAID 2200S controller. Details will not be offered, and optional parameters or selections along the way will not be explored. For more details, please consult the *Adaptec SCSI RAID Software User's Guide* included on the CD.

This quick installation also assumes that the controller card and drives have been installed. Two installation scenarios will be presented, one using the ARC utility that is embedded on the controller card. When using ARC to construct an array, the system will require a keyboard and display.

The other method will be to use the CD to construct the RAID 5 by using the boot capability of the CD. This will also be done directly on the Managed System using a keyboard, mouse, and display.

Using the Adaptec RAID Configuration (ARC) Utility

1 Start or restart the system. Press **CTRL-A** when the display indicates the Adaptec SCSI RAID controller is being started by displaying lines of text starting with:
Adaptec SCSI RAID. . .

2 A blue-background screen appears with the title Adaptec 2xx0S RAID Controller SCSISelect Utility. Press **Enter** since the desired Array Configuration Utility is highlighted by default.

> **Note:** If more than one controller of the Adaptec SCSI RAID 2120S/2200S family is installed, the first screen will show the controllers present. Highlight the controller you wish to use and press **Enter** to get to the screen in this step.

3 The Array Configuration Utility screen appears. Using the arrow keys, highlight **Initialize Drives**, then **Enter**.

> **Note:** All drives being used in an array or volume must be initialized.

4 Using the arrow keys again, highlight the three drives to be used for the RAID 5, press **Insert** when a desired drive is highlighted. Selected drives will be displayed in the box on the right side of the display. When the desired three drives are on the right side, press **Enter** to continue.

5 A red warning box appears. Press **Y**, then **Enter** to continue. The system will initialize the selected drives, in a few seconds.

6 The Array Configuration Utility screen reappears. Using the arrow keys, highlight **Create Array**, then **Enter**.

7 Using the arrow keys as in Step 4, highlight the three drives for the RAID 5, press **Insert** when a desired drive is highlighted. When the desired three drives are on the right side, press **Enter** to continue.

8 On the next screen, most of the default entries will be used by pressing **Enter** when they are highlighted. Make the following selections and entries:

Property Line Displayed	Entry or Selection
Array Type	Select RAID 5, press **Enter**
Array Label	Type a suitable name in the space provided, press **Enter**.
Array Size	**Enter**. Press **Enter** again to use the default drive granularity of GB.
Stripe Size	**Enter**
Read Caching	**Enter**
Write Caching	**Enter**
Create RAID via	**Enter**
[Done]	**Enter**

A Creating Array window appears briefly. Press **Enter** to continue with the array configuration.

Note: The array will be usable immediately, but will continue to build until finished, impacting performance until it is done.

9 Press **Esc** until the Exit Utility window appears. Highlight **Yes**, then press **Enter**. The system will restart. If an operating system needs to be loaded, it may be loaded using the normal installation instructions for that operating system onto the RAID 5 as a single drive.

10 You will need to load the appropriate driver for the Adaptec SCSI RAID controller card to support that operating system once the operating system is installed.

Using the Adaptec Bootable CD

1 Insert the CD and start the system.

> **Note:** During the system start, you may need to enter the system's BIOS settings and enable booting from the CD. Other settings may be needed if this system has been configured to operate without a display of input devices.

2 Select the appropriate language on the Language screen, press **Enter**. Read the information on the Licenses screen, then press **Enter** again.

3 After a number of seconds, the system will display the Adaptec Bootable CD Main Menu. Select the option **Launch Configuration Utility**.

4 The system will start Mozilla as a browser and launch Adaptec Storage Manager-Browser Edition.

5 On the Storage Manager screen that appears, click on the ▶ next to the drive icons shown on the left side of the screen. The drive icons will now be shown one per line underneath one another.

6 Click the **Create** button on the right side of the screen. The display will expand to include a yellow Create area, starting with step 1 of 3.

7 In step 1 of 3, click the **RAID 5** button, then **Next**.

8 In step 2 of 3, click the three drives to be used in your RAID 5 on the left side of the screen. Each selected drive will have a checkmark. Click **Next**.

9 On step 3 of 3, type the name you wish to assign to the RAID 5 you are creating, then click **Finish**.

A pop-up window appears, notifying you that the system is creating the array in hardware. When it disappears, the display will refresh. It will look the same as it did originally, with the addition of showing the RAID 5 you've created appearing on the right side of the display as a dynamic icon with a 5. You may use the array immediately, but you may wish to allow the array to finish building before restarting the system, especially if you are going to install the operating system to the new array.

When you are ready to continue, close the Mozilla window that is the active browser. You are back on the Main Menu. If desired, you may wish to review other documentation before proceeding.

Click **Reboot** to restart your system. Remove the CD when the system ejects it.

You may now use the system as you normally would, with the three drive RAID 5 acting as a logical drive. You may install an operating system to this drive, or use the RAID 5 as you would any disk drive.

3

Installing the Driver

In this Chapter

This chapter presents several scenarios for installing the controller driver. First, create any driver disk(s) you will be needing by following the instructions in the next section. Then, identify the appropriate operating system and installation scenario, read the entire procedure and related explanations before proceeding.

Driver Disks

Any system having an Adaptec SCSI RAID controller installed will need to have an appropriate driver installed for the controller to operate properly.

Note: When using Adaptec Storage Manager-Browser Edition to create and manage arrays, a system that is not acting as a managed system will not require a driver to be installed.

Installations are easier when the drivers are available on a floppy disk. Creating this driver disk from the CD included with the controller is simple. There are two ways shown on the following pages for making the driver disk. The first starts your system from the CD and is suggested if you are building a new system, if the system isn't running as you start this driver installation, or if your system doesn't run Windows.

If you are adding a new driver to a system that is already running, starting from the CD may not be desirable. For those situations, you can create the driver disk by inserting the CD into a running system (or by using another system, since this technique works on Windows systems) and following the directions on the next page.

Note: When creating a driver disk for Linux system use, four types of processor types are offered; i386, i586, i686, and Athlon. Use the driver that supports the processor on your system.

Driver	386	486	P1	P2	P3	P4	K-6	Athlon
i386	x	x						
i586			x	x				
i686					x	x	x	
Athlon								x

A Note About CD Support

If the CD-ROM reader device is attached to the controller card included as part of this kit, the controller BIOS will need to be configured to allow the CD reader to work. To configure the card for this use, follow these steps:

1 While the system is starting, press **Ctrl-A** when the controller card displays its message on the screen.

2 When the first SCSI Select Utility window appears, select the option **SCSI Select Utility**.

3 Click **Controller Configuration**.

4 Use the arrow keys on your keyboard to position the cursor over **CD-ROM Boot Support**, then **Removable Media Devices Support**. Make both lines Enabled, if they aren't already.

5 Press **Esc** until the Reboot window appears. Allow the system to restart.

Creating the Driver Disk from the Bootable CD

These instructions cover creation of disks for Windows, Novell, SCO Unix, and Linux. To create a driver disk:

1 Ensure your system BIOS is ready to boot from the CD-ROM drive. See your system documentation if you need help. Insert the CD that came with the controller, and start your system from the CD. Follow instructions and respond to prompts as necessary to get to the Adaptec Main Menu.

2 From the Main Menu, select **Create Driver Disk(s). . .**

3 Review the type of installation you are doing elsewhere in this chapter to know what type of driver disk to create. Click on the type of driver disk desired, then click **OK.**

4 When the screen prompts you to insert a disk and click OK, do so. The system will format the disk, insert a file system, if needed, and write the appropriate information onto it. When finished, the screen will display another OK button.

5 Remove the driver disk and click **OK**. Label the disk to represent the driver disk created.

After creating the disk, keep it ready for the installation you will be following later in this chapter.

Creating the Driver Disk on a Windows System

Use the CD to create the driver disk by inserting the CD into a CD-ROM drive on a Windows system.

1 When the menu appears, select **Create Driver Diskette.**

2 Enter the number representing the operating system desired, then press **Enter**.

3 Follow the prompts given. The driver disk will be formatted if selected, then the desired information will be copied to it.

4 Remove and label the disk as a Driver Disk, note the operating system supported.

New Installations

For new installations of any of the operating systems supported, it is possible, if not desirable, to install the operating system on an array. This provides a more robust system when using a redundant array, since failure of a drive won't cause the system to stop running.

Any such installation requires that the redundant array be created prior to installing the operating system. Adaptec SCSI RAID controllers provide two ways to do this, by starting (also called booting) the system using the Adaptec CD, or by using the tools built into the on-board firmware on the controller.

It is beyond the scope of this presentation as to which RAID type to use for this application. But, since the user may want some guidance, the following condensed table may offer help. For more details, consult external resources detailing relative performance vs. desirable characteristics for the various RAID types.

RAID Type	Minimum Number of Drives	Properties
0	2	Not redundant - do not use RAID 0 for this application if you want the protection afforded by redundancy.
1	2 only	Fast writes and reads, equivalent to the transfer rate of the constituent drives.
5	3	Comparable read speed but rather slow write speed compared to constituent drives.
10	4	Requires multiples of 2, starting with 4. Provides the speed of a RAID 0 with the redundant protection of a RAID 1.
50	6	Requires a minimum of 6 drives. Provides greater efficiency in drive usage than a RAID 10.

Windows 2000 and XP

The following sections describe procedures for installing the Adaptec SCSI RAID 2120S/2200S controller with Windows 2000 or Windows XP. The following installation scenarios are described:

■ *Installing the Driver in a New System on page 3-6*

■ *Adding the Controller to an Existing System on page 3-7*

Installing the Driver in a New System

In this scenario, you are installing the Adaptec SCSI RAID controller in a new system that has no operating system.

To install the driver:

1 Install and configure the controller and hard disk drives according to the instructions in Chapter 2.

2 Start the system, pressing **Ctrl-A** to enter the BIOS-based configuration utility. Use the configuration utility to create the RAID array and logical drive to which you will install Windows. For details, refer to *Creating a RAID 5 Without an Operating System on page 2-9*.

3 When the array has been built and is finished building, restart the system. Insert the Windows 2000 or XP setup CD as you restart to begin the Windows installation.

4 Early in the Windows installation, a screen with white text and a blue background appears after the hardware detection message, prompting you to install a third-party driver, press **F6**.

> **Note:** You only have 5 seconds to press the F6 key during the installation startup. A prompt appears at the bottom of the screen when F6 is active. Press **F6** at this time; otherwise, you must restart the Windows installation process to complete this procedure correctly. The Windows installation will not be able to recognize the controller and array until the driver is in place.

5 Insert the driver disk and wait until prompted to install a driver. Press **S** to specify that the driver is on the floppy disk, and press **Enter**. The installation process will read the disk looking for a suitable driver.

6 When the Adaptec SCSI RAID driver is found, press **Enter**. Follow the on-screen instructions, responding as needed to complete the installation.

Adding the Controller to an Existing System

In this scenario, you are adding an Adaptec SCSI RAID 2120S/ 2200S controller to a system that already has a Windows 2000 or XP operating system.

To install the driver:

1 Install and configure your controller and hard disk drives according to the instructions in Chapter 2.

2 Start Windows. Windows launches the Found New Hardware Wizard, which searches for the controller driver.

3 Insert the driver disk you created at the beginning of this chapter. Select the disk drive as the source, then click **Next.**.

Since the driver is also on the installation CD, you may wish to insert the installation CD and have Windows search it for the driver. Windows will find multiple drivers, select the appropriate one for the operating system being used.

4 Click **Next** in the succeeding two windows that appear and follow the on-screen instructions to complete the controller installation.

5 Remove the driver disk and restart the system.

Windows NT 4.0

The following driver installation scenarios exist for Windows NT 4.0:

- *Installing the Driver in a New System on page 3-8*

- *Adding the Controller to an Existing System on page 3-9*

Installing the Driver in a New System

In this scenario, you are installing an Adaptec SCSI RAID controller and Windows NT 4.0 in a new system.

> **Note:** If Windows NT is to coexist with another operating system, the other operating system must be installed before you install Windows NT.

To install the driver:

1 Install and configure your Adaptec SCSI RAID controller and hard disk drives according to the instructions in Chapter 2.

2 Start the system, pressing **Ctrl-A** to enter the BIOS-based configuration utility. Use the configuration utility to create the RAID array and logical drive to which you will install Windows. For details, refer to *Creating a RAID 5 Without an Operating System on page 2-9*.

3 When the array has been built and is finished building, restart the system. Insert the Windows NT setup CD or disk as you restart to begin the Windows installation.

4 Early in the Windows installation, a screen with white text and a blue background appears after the hardware detection message, when it appears, press **F6**. If you miss pressing **F6** in time, you will need to restart the system.

> **Note:** You only have 5 seconds to press the F6 key during the installation startup. Press **F6** at this time; otherwise, you must restart the Windows installation process to complete this procedure correctly. Windows will not be able to recognize the controller and array without the driver.

5 Insert the driver disk you created at the beginning of this chapter. Press **S** to specify that the driver is located on the floppy disk, and press Enter. The installation process will read the disk looking for a suitable driver.

6 When the **Adaptec SCSI RAID** driver is found, press **Enter.** Follow the on-screen instructions, responding as needed to complete the installation.

Adding the Controller to an Existing System

In this scenario, you are adding an Adaptec SCSI RAID controller to an existing Windows NT system.

To install the driver:

1 Before adding the controller or shutting down the system, open the Control Panel. Click the **SCSI Adapters** icon. Then select the **Drivers** tab and click **Add**.

2 Insert the driver disk you created at the beginning of this chapter, then click **Have Disk**. Since the driver is also on the installation CD, you may wish to insert the installation CD and have Windows search it for the driver. It would be located in a driver folder at <drive letter of the CD>/packages/ Windows_NT.

3 Select **Adaptec SCSI RAID 2xx0S Controller**.

4 After the driver is loaded, shut down the system.

5 Insert the Adaptec SCSI RAID controller. For installation details, refer to Chapter 2.

6 Start the system.

7 If you are removing an existing controller, you should also remove the old driver. To do so, open the Control Panel, click the **SCSI Adapters** icon, select the old driver, and click **Remove**.

Linux

The Adaptec SCSI RAID controller supports Red Hat 7.2 and 7.3, and SuSE 7.3 and 8.0.

✓ **Note:** For the most up-to-date information on Adaptec's support of Linux, or to download driver sources, visit http://linux.adaptec.com.

Installing the Driver to an Existing Linux System

The *Adaptec SCSI RAID Installation CD* contains precompiled module drivers and storage management software in RPM (Red Hat Package Manager) format. For current information, visit http://linux.adaptec.com.

The 2.0 driver RPM has precompiled module drivers for the following kernels:

Vendor	Version	Kernel Version
Red Hat	7.3	2.4.18-3
	7.2	2.4.9-11
SuSE	8.0	2.4.18
	7.3	2.4.10

✓ **Note:** Kernel versions not listed may have the drivers already embedded. In those cases where the drivers are not available, you may need to create a custom driver.

To add the driver to a supported Linux system:

1 Ensure the CD-ROM drive is mounted, then install the driver RPM. This can be done by typing:

```
rpm -Uvh <mount-point>/packages/Linux/
driver_package/aacraid-0.9.10-27D.i386.rpm
```

2 Run fdisk, mkfs, and create mount points for any new drives.

Red Hat Linux

> **Note:** A SCSI CD-ROM drive attached to the controller cannot be used in any installation of an Adaptec SCSI RAID 2120S/2200S to a system that will be running Linux. This restriction isn't just for the installation of the driver or the operating system, but generally. The Adaptec SCSI RAID 2120S/2200S Linux driver will not operate with anything but hard disk drives.

Installing the Driver in a New Red Hat 7.2 Linux System

In this scenario, you are installing the controller in a new Red Hat Linux system.

> **Note:** To install Red Hat to drives using an Adaptec SCSI RAID 2120S/2200S, you need to download the updates disk for the Anaconda Installer from www.redhat.com. A bug in the Red Hat installer for 7.2 makes this necessary. This updates disk will be used in the following installation steps.

To install the driver:

1 Install and configure your Adaptec SCSI RAID controller and hard disk drives according to the instructions in Chapter 2.

2 Start the server. During startup, press **Ctrl+A** to start ARC. Use ARC to create the RAID. For details, refer to *Using the Adaptec RAID Configuration (ARC) Utility on page 2-9*.

3 Insert the Red Hat CD Disk 1 in the CD-ROM drive.

4 Start the system.

5 When the Red Hat welcome screen appears, type the following at the boot prompt:
```
linux dd noprobe updates
```

6 When prompted, insert the driver disk you created at the beginning of this chapter and select **OK**.

7 Insert the updates disk when prompted.

8 Follow the prompts to set up your preferred environment.

9 If you intend to install other third-party devices, proceed with the installation of those devices. Otherwise, select **Done**.

10 Continue with the Linux installation according to the Red Hat documentation.

Installing the Driver in a New Red Hat 7.3 Linux System

In this scenario, you are installing the controller in a new Red Hat 7.3 Linux system.

To install the driver:

1 Install and configure your Adaptec SCSI RAID controller and hard drives according to the instructions in Chapter 2.

2 Start the server. During startup, press **Ctrl+A** to start ARC. Use ARC to create the RAID. For details, refer to *Using the Adaptec RAID Configuration (ARC) Utility on page 2-9*.

3 Insert the Red Hat CD Disk 1 in the CD drive.

4 Start the system.

5 When the Red Hat welcome screen appears, type `expert` at the boot prompt.

6 When prompted, insert the driver disk you created at the beginning of this chapter and select **OK**.

7 Follow the prompts to set up your preferred environment.

8 If you intend to install other third-party devices, proceed with the installation of those devices. Otherwise, select **Done**.

9 Continue with the Linux installation according to the Red Hat documentation.

SuSE Linux

Installing the Driver in a New SuSE Linux System

In this scenario, you would be installing the controller in a new SuSE Linux system.

As this document was being prepared for release, SuSE Linux does not support using the Adaptec SCSI RAID 2120S/2200S controllers as a primary controller. This prevents using any drives attached to either of these controllers from acting as the boot device.

Adaptec is working on a solution to this problem. To find the latest developments about using the Adaptec SCSI RAID controllers as a primary with SuSE Linux, go to the web site linux.adaptec.com.

Installing the Driver in an Existing Linux System

The *Adaptec SCSI RAID Installation CD* contains precompiled module drivers and storage management software in RPM format. For current information, visit http://linux.adaptec.com.

To install the driver:

1 Insert and mount the Adaptec SCSI RAID Installation CD.

2 Install the aacraid.img driver file. This can be done by typing:

```
rpm -Uvh <mount point>/packages/Linux/
driver_package/aacraid-0.9.10-27D.i386.rpm
```

3 Run fdisk, mkfs, and create mount points for any new drives.

Novell NetWare

The *Adaptec SCSI RAID Installation CD* contains device drivers for NetWare 5.1 and 6.x. The following Novell support packs are the minimum level required before installing Adaptec SCSI RAID controller software and drivers:

NetWare Revision Level	Support Pack
5.1	5
6.0	2

After you have installed the drivers, you can use the normal NetWare procedures for modifying disk partitions, applying hot fixes, or performing volume maintenance.

Adaptec Storage Manager-Browser Edition will not run on a NetWare system. Creating and managing arrays on a NetWare system may be done using any of the following:

■ Using ARC during the starting of the system.

■ Using the managed system components installed on the NetWare system, and a remote Windows or Linux system running Adaptec Storage Manager-Browser Edition.

■ Using Command Line Interface on the NetWare system in DOS mode.

Installing the Driver for a Boot Controller in a New NetWare 5.1 or 6 Server

In this scenario, you are installing the Adaptec SCSI RAID controller as a boot controller in a new NetWare 5.x or 6.x server.

To install the driver:

1 Install the Adaptec SCSI RAID controller as the primary controller and attach the disk drives.

2 Start the server. During restart, press **Ctrl+A** to start ARC. Use ARC to create the RAID. For details, refer to *Using the Adaptec RAID Configuration (ARC) Utility on page 2-9*.

3 Install and configure a secondary controller, if any.

4   Begin installing NetWare 5.1 on your server as instructed in your NetWare documentation. Make sure that you have the aacraid.ham and aacraid.ddi files available on the driver disk created at the beginning of this chapter.

5   When the Device Types screen appears, check the **Storage adapters** list and select **Modify** to add another driver.

6   Select the **Storage adapters** and press **Enter**. A list of recognized controllers will be displayed. If AACRAID was detected, delete it.

7   Press the **Insert** key to add another driver. The list of available drivers will be displayed on this screen.

8   Press the **Enter** key to scan drive A for the driver. You have a choice to press **F3** and specify the path to the driver if it does not reside on drive A.

9   Once the driver is selected, the installation process returns to the parameter screen.

10 Verify the list of the loaded drivers and from the lower window menu, select **Continue** and press **Enter**.

> **Note:** If the driver installation process does not complete successfully you will be taken back to the server console to examine the cause of the failure.

Installing the Driver in an Existing NetWare 5.1 or 6 Server

In this scenario, you are integrating an Adaptec SCSI RAID controller into an existing Novell NetWare 5.1 or 6 server as a secondary controller.

To install the driver:

1   Upgrade your NetWare server to the minimum patch level specified by Novell.

2   Make a backup copy of the driver.

3   Shutdown the server.

4   Install and configure the Adaptec SCSI RAID controller as a secondary controller according to the instructions in Chapter 2.

5   Start the server.

6   At the NetWare server console prompt, type
       `load nwconfig.nlm` and press **Enter**.

7   Select **Driver Options** and press **Enter**.

8   Select **Configure disk and storage device drivers** and press
       Enter.

9   Select **Select an additional driver** and press **Enter**.

10 Place the driver disk into the floppy disk drive and press the
       Insert key. A list of available drivers will be presented. Press the
       Insert key again to access the list of additional drivers.

11 Press **Enter** to scan for the drivers. Drive A will be scanned by
       default, press **F3** and specify the path if the driver is located in
       another place.

12 Select **Adaptec AdvancedRAID Controller** and press **Enter**.
       This will bring you to the aacraid Parameters screen.

13 Select **Select/Modify driver Parameters** and press **Enter**.

14 Select **Save parameters and load driver**.

15 At the prompt Do you want to select an additional disk driver?,
       select **No**.

16 Press **Esc** to exit Nwconfig utility.

17 Create any arrays desired using the tools mentioned at the
       beginning of this section on page 3-14.

Loading the NetWare Drivers at Server Bootup

To automatically load the aacraid.ham driver at server bootup, the
startup.ncf file (usually located in your server's startup directory)
must contain a load command line that specifies the location of the
driver and any appropriate command line options. For additional
information on the startup.ncf file, refer to your NetWare
documentation. The correct syntax to load the driver is:

    load [pathname]aacraid.ham slot=number [options]

For example, the command line to load the driver from the c:\nwserver directory, with the verbose= option on is:

    load c:\nwserver\aacraid.ham slot=2 verbose=y

Command line options are not case sensitive. Placing commas between command line options is optional. To modify the startup.ncf file, follow these steps:

1 **At** the server console prompt type `load nwconfig` and press **Enter**.

2 Select the **NCF File Options** menu and press **Enter**. Select the **Modify Startup.ncf** option and press **Enter**.

3 Make the necessary changes. When you are done, press **Esc**.

> **Note:** You can also use your DOS text editor to modify the startup.ncf file, it resides on the DOS partition.

UNIX

Installing the drivers for any of the UNIX systems is designed to be done only from the driver disk, the creation of which is detailed at the beginning of this chapter.

SCO OpenServer 5

Installing the Driver on a New System

In this scenario, you are installing the controller and driver in a new OpenServer 5.x system.

To install the controller and driver:

1 Install and configure your Adaptec controller and hard disk drives according to the instructions in Chapter 2. Create the RAID that will host the operating system using the BIOS-based utility that is built into the controller. See *Creating a RAID 5 Without an Operating System on page 2-9* for details.

2 Create the driver disk as shown at the beginning of this chapter. When finished, remove the driver disk.

3 Start the system and insert the installation CD for OpenServer 5. Once the system starts loading from the CD, it will display a Boot: prompt. When it does, insert the driver disk and type:

```
def bootstr link=aacraid
```

4 The system will continue the installation, using the driver information from the driver disk. Continue the installation as detailed in the instructions that came with OpenServer 5.

5 When the OpenServer installation completes, remove the driver disk and reboot the system.

The boot driver installation process is complete.

> **Note:** You can run the drive_config utility only once. OpenServer's method of statically configuring each driver into the kernel can cause confusion for the user. The difficulty arises from OpenServer's convention for naming drives. The drive_config utility overcomes this limitation by automatically creating the appropriate kernel entries and then rebuilding/relinking the kernel. The drive_config utility automatically creates device special files in the /dev/rdsk and /dev/dsk directories. These files are named in the c#t#d#s# (controller number, target number, disk number, fdisk partition number) format. On a boot array, the files c0t0d0 and c0t0d0s0 point to the entire disk.
> For information on disk partitioning conventions, visit http://www.sco.com.

Adding the Controller to an Existing System

In this scenario, you are adding an Adaptec SCSI RAID controller to an existing SCO OpenServer 5.*x* system.

To install the driver:

1 Install and configure your Adaptec SCSI RAID controller and hard disk drives according to the instructions in Chapter 2.

2 Create a driver disk, see the beginning of this chapter.

3 Boot the server.

4 After the OpenServer system has booted, insert the driver disk.

5   To run the installpkg utility, type `installpkg -d disk/`.
    SCO UNIX reads the disk and prompts you to enter the package
    name to be installed.

6   Type `aacraid_tar.z` and press **Return**.

7   After the package is installed, rebuild the kernel.

8   Restart the system.

9   Install the new kernel.

10 Add devices to the controller.

UnixWare 7 and OpenUNIX 8

Both UnixWare 7 and OpenUNIX 8 use the same procedures for
adding the driver to the system, whether an initial installation or
just adding to an existing system. The driver disk you create will be
specific to one operating system or the other. Once the driver disk
is created, there is no difference in the installation.

Installing the Driver on a New System

In this scenario, you are installing the controller and driver for a
system on which either OpenUNIX 8 or UNIXWare 7 is being
installed as the operating system. The operating system will be
installed on an Adaptec RAID controller-based RAID.

To install the driver:

1   Install and configure your Adaptec controller and hard disk
    drives according to the instructions in Chapter 2.

2   Create the driver disk as shown at the beginning of this chapter.

3   Early in the operating system installation, you will be shown a
    window labeled Choose One, insert the driver disk, select the
    Install HBA diskette entry, then press **F10**. The driver will load
    from the driver disk and return to the HBA screen. Select
    Proceed with Installation and press **F10**.

4   Complete the installation as appropriate.

5   When the installation completes, remove the driver disk and
    reboot the system.

The boot driver installation process is complete.

Adding the Controller to an Existing System

In this scenario, you are adding an Adaptec SCSI RAID controller to an existing UnixWare 7or OpenUNIX 8 system.

To install the driver:

1 Shut down the system. Install and configure your Adaptec SCSI RAID controller and hard disk drives according to the instructions in Chapter 2.

2 Create the driver disk as shown at the beginning of this chapter.

3 Boot the system. After the system has booted, insert the driver disk.

4 To run the installpkg utility, type `installpkg -d disk/`. UNIX reads the disk and prompts you to enter the package name to be installed.

5 Type `aacraid_tar.z`.

6 After the package is installed, rebuild the kernel when you are asked if you wish to rebuild.

7 Restart the system.

8 Add devices to the controller.

4

Installing Adaptec Storage Manager- Browser Edition

In this Chapter

About Adaptec Storage Manager-Browser Edition

Adaptec has developed a new iteration of our RAID controller software, part of the Adaptec Storage Manager Family. A more detailed coverage of the installation and use of this application is available on the CD that came with the Adaptec SCSI RAID controller. Examine the electronic book *Adaptec SCSI RAID Software User's Guide*.

> **Note:** Adaptec Storage Manager-Browser Edition will operate with Adaptec RAID controllers other than the Adaptec SCSI RAID 2120S/2200S. To do so requires the installation of Adaptec Storage Manager, an earlier version of the controller software, available for installation on the CD that came with the Adaptec RAID controllers. Storage Manager may be installed before or after the Browser Edition.

Software Components

Some users may wish to understand how the software applications supplied by Adaptec work. Understanding is helpful in knowing what components to install when using networked computers to host specific parts of the Adaptec RAID managing function.

The components of Adaptec Storage Manager-Browser Edition may be distributed on separate computers - the User System, a Web Service, and the Managed System(s) hosting the drive arrays.
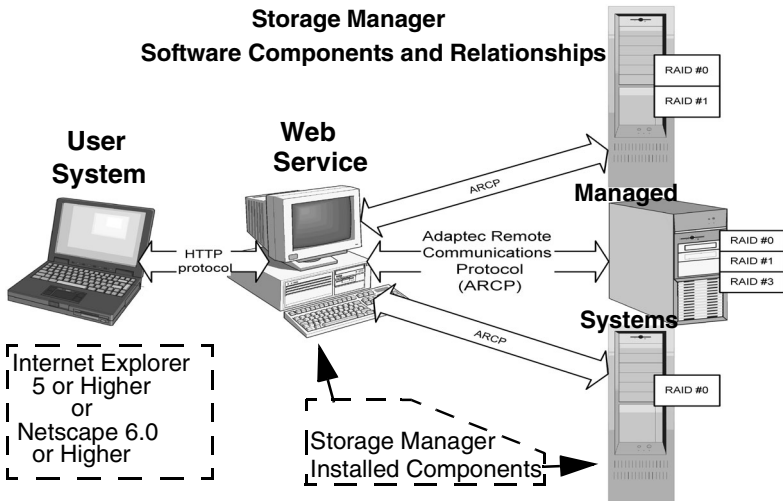

This was designed to provide flexibility in administering and managing storage subsystems on a network. Each component of an Adaptec Storage system may be located on a different system in a network. There is no restriction on combining two or all three components on one system.

The HTTP and ARCP protocols used to communicate between sections of the system both are sent over common network wiring, or within the system if installed on the same machine. No additional wiring is needed. When two or more of the functions are combined within a single computer, the signaling between functional sections is handled within the computer.

The installation of Adaptec Storage Manager-Browser Edition will usually be accomplished satisfactorily by using the default *Typical* installation option. If your needs require the use of SNMP, install optional components using the *Custom* install option, or see the *Adaptec SCSI RAID Software User's Guide* for details on installation options. Your installation of Adaptec Storage Manager-Browser Edition should match one of these:

1 **Everything installed on one computer.** This consolidated system, running the User System, Web Service, and Managed System components, will require a supported web browser and installation of all components of Adaptec Storage Manager-Browser EditionThe consolidated system must have Adaptec Storage Manager-Browser Edition installed from the installation CD. This configuration is handy for a small office or individual user. If an internet connection isn't needed, a TCP/IP stack will still be needed to let the components of Adaptec Storage Manager-Browser Edition function..
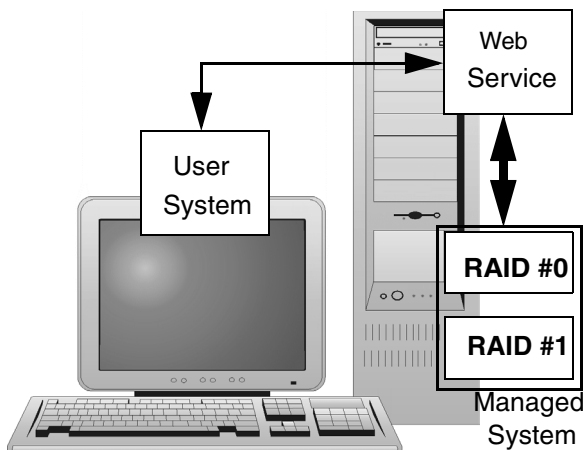
Bear in mind, that because the User system portion requires a supported browser to function, this type of installation can only be done on supported Windows or Linux systems.

2   Installing to a Consolidated System

Set up the browser portion using either *User System Preparation Using Internet Explorer on page 4-7* or *User System Preparation Using Netscape Navigator on page 4-8*. Then install Adaptec Storage Manager-Browser Edition from the CD using the Typical selection.

The remaining system setup configurations are presented for your information. If you wish to pursue one of these alternative configurations, see the *Adaptec SCSI RAID Software User's Guide* for more information.

a   Each component installed on a separate networked computer. User Systems attach to a system running the Web Service using a web browser. The Managed System(s) may be distributed about the enterprise as needed. This configuration is most likely to be found in a corporate or similar setting. The Managed Systems may be using any of the supported operating systems.

b   User System and Web Service on one computer. The system(s) being used to manage the RAIDs all communicate to the Managed System(s) through the Web Service installed in one or more of the User Systems.

c   Web Service and Managed System on one computer. User System(s) all connect to a Managed System that has the Web Service component included. Multiple User Systems may be connected via network connections, and multiple Managed Systems may be connected, as long as the Web Service component is available.

In operation, Users will log-on to the Managed System having the Web Service installed using normal network log on protocol. In practice, especially when using the Typical installation to install Adaptec Storage Manager-Browser Edition, users will need to connect to one of the Managed Systems to access all Managed Systems on the network.

Using Custom or Minimal Installations

Installing using the **Minimal** components is meant for creating a managed system only, which will be controlled remotely. Install using the **Custom** components if any of the following are needed. Note that the first 3 are checked already, and are the components installed when Typical is selected. Selected by checking the appropriate box when displayed:

■ **Managed System Components**—Same as a Minimal installation. Managed System components only are installed.

■ **Adaptec Web Server**—Installs components allowing Adaptec managed systems to communicate with HTTP browsers.

■ **Adaptec Storage Manager Notifier**—installs messaging elements providing email and broadcaster capabilities.

■ **Adaptec SNMP**—Installs components used by some third-party applications for messaging RAID information. Requires Microsoft SNMP agents to be installed to function.

Installing Adaptec Storage Manager-Browser Edition

Installation will differ slightly when installing to a supported Windows system or to a Linux system.

Note: Some aspects of installing this application are covered in Chapter 3 of the *Adaptec SCSI RAID Software User's Guide*. Look in the sections *Login to Adaptec Storage Manager* and *Installing a Security Certificate* if help is needed.

Windows System

Windows systems must be Windows NT 4, Windows 2000, or Windows XP. The file system used should be either FAT 32 or NTFS. When installing on a FAT 32 file system, the folder being installed will automatically be given the hidden attribute.

To install the application on a Web Server or a Managed System:

1 Insert the CD into a CD-ROM drive. If it doesn't start automatically, click or start **Autorun.exe** to start the opening screen.

2 Click **Install Adaptec Storage Manager - Browser Edition**.

3 The InstallShield Wizard will start by displaying a window in the lower right corner of your display. In a few seconds it will display a larger window in the middle of your screen. The remaining installation windows will all occur in this window named InstallShield Wizard. The screen names used will be shown at the top of the InstallShield Wizard window.

4 Click **Next** in the **Install Adaptec Storage Manager - Browser Edition** window.

5 Read the license information. If you agree to the terms of the license, click **Yes** in the License Window. If you don't, click **No** and terminate the installation.

6 The Select a Setup Type window appears. In it, you have three types of installations possible, Typical, Compact, and Custom. *Typical* is the default and works for most of the scenarios described earlier. *Custom* allows the expert user to select and install specific components. *Compact* installs only the managed system components, see *Using Custom or Minimal Installations on page 4-5*.

7 Click **Next** on Destination Folder.

8 Click **Next** on Setup Information.

9 The Setup Status window shows the installation progression using a scroll bar. Before the scroll bar shows the installation is completed, another window will pop up indicating that a security certificate has been generated. Click **OK** in that window to complete the installation.

10 When the application is finished installing, another window will display Yes, I want to restart my computer now or No, I will restart my computer later. Yes is the default. Click **Finish**.

11 The system will restart to complete the installation. Extract the CD before the system restarts.

The User system requires a web browser supporting JavaScript and cookies only. Internet Explorer versions 5, 5.5, or 6 work well, as does Netscape versions 6 and above. You will need to log on to your system with administrator privileges for Storage Manager to function properly. Following are ways to check and configure appropriate versions of Internet Explorer and Netscape Navigator.

User System Preparation Using Internet Explorer

While the security settings used are up to the user, problems may be caused when using the *High* security setting in Internet Explorer. High security typically disables Javascript. When using high security levels in a Web Browser the following Intranet settings need to be manually enabled:

■ JavaScript

■ Cookies (not stored)

The following custom level security settings need to be enabled for the Local Intranet in Internet Explorer 5 and 5.5. Look under **Tools | Internet Options...** for these settings:

■ Active Scripting

■ Allow per session cookies (not stored)

> **Note:** In Internet Explorer 6.0 there is not a security setting for this. Cookie configuration was moved from under the Privacy tab. There is no setting for blocking Intranet cookies.

■ Bypass the proxy server for local addresses, if you are using proxy servers.

   ■ Still in the **Tools | Internet Options...** area, click the **Connections** tab.

   ■ Click the **Lan Settings...** button.

   ■ If the Use a proxy server box isn't checked, exit by clicking **OK**. You aren't using a proxy server and needn't worry about this setting.

- ■ If the Use a proxy server box is checked, make sure the Bypass proxy server for local addresses box is checked, then click the **Advanced...** button.

  - ■ In the Exceptions window, enter `localhost*` as an entry.

- ■ When finished, click **OK** three times to enter the information and close the Tools windows.

User System Preparation Using Netscape Navigator

Follow these steps to set up Netscape Navigator version 6 or higher. You will need to be logged on to your system with root privileges or rights to access Storage Manager.

Note: The following works with Netscape 6.0. Higher versions may have these controls distributed differently.

---

1 From the main Netscape screen, select **Edit** -> **Preferences**.

2 On the Preferences window, click the ▶ on the Privacy and Security line. Ensure that either of the Enable cookies selections is selected by clicking the radio button for that line.

3 Select the **Advanced** line. Ensure that **Enable Javascript for Navigator** is checked.

4 Exit Navigator, then restart it. This enables any settings you have modified.

5 You are now ready to use the information in the *Adaptec SCSI RAID Software User's Guide*.

Linux system

To install the application on a Linux-based Web Server or a Managed System:

> **Note:** Remember that Linux and Unix are both case sensitive.

1 Insert the CD into a CD-ROM drive.

2 Install the software by typing:
`sh <mount-point>/install.sh.`
`<Mount-point>` may change from one Linux system to the next, depending on your settings, but often is `/mnt/cdrom` or `cdrom`.

3 The Select a Setup Type window appears. In it, you have three types of installations possible, Typical, Compact, and Custom. *Typical* is the default and works for all the scenarios described earlier. *Custom* allows the expert user to select and install specific components, including communications agents not loaded with the *Typical* setting. *Compact* installs only the managed system components.

4 The installation will include a short cut to opening Adaptec Storage Manager in the System tab.

5 Unless the driver was installed as part of the installation, it will not be necessary to restart the system, but be sure to extract the CD.

The User system requires only a web browser supporting JavaScript and cookies. The installation of Adaptec Storage Manager installs a version of Mozilla that will be launched if you use the short cut link supplied at the System tab. You will need to log on to your system with root privileges for Storage Manager to function properly.

UNIX Systems

Unix systems may only be used as a managed system. Thus, only two of the installation options are usable. Compact, which installs the managed system components. Or Advanced, in which you would select the managed system components and may wish to add the SNMP agent for remote communications.

Most installations will be made using the install script by running sh by typing the following:

```
sh <mount-point>/install.sh
```

`<Mount-point>` may change from one Unix system to the next, depending on your settings, but often is `/mnt/cdrom` or `cdrom`.

The install script interrogates the system to determine the type of Unix installed. It then installs components needed for that operating system. Remember that Unix is case sensitive.
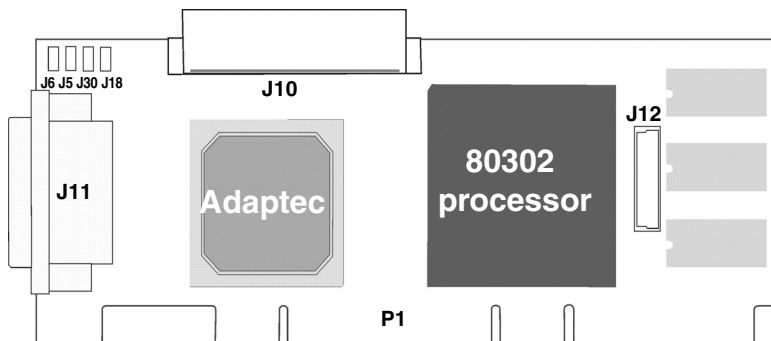
A

Card and Module Diagrams

In this Appendix

Adaptec SCSI RAID 2120S

Part	Description
J5	CLR - Reserved
J6	FLASH - Reserved
J10	Internal Ultra320 SCSI connector
J11	External Ultra320 SCSI connector
J12	Battery module connector
J18	BUSY - use to drive an LED for disk drive activity.
J30	MISC - Reserved
P1	PCI Connector

Adaptec SCSI RAID 2200S
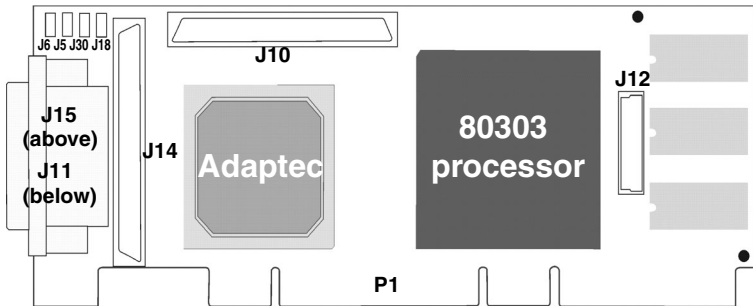
Part	Description
J5	CLR - Reserved
J6	FLASH - Reserved
J10	Internal Ultra320 SCSI connector for Channel A
J11	External Ultra320 SCSI connector for Channel A
J12	Battery module connector
J14	Internal Ultra320 SCSI connector for Channel B
J15	External Ultra320 SCSI connector for Channel B
J18	BUSY - use to drive an LED for disk drive activity.
J30	MISC - Reserved
P1	PCI Connector

Adaptec ABM-300 Battery Module

bottom - circuit side   top - battery side
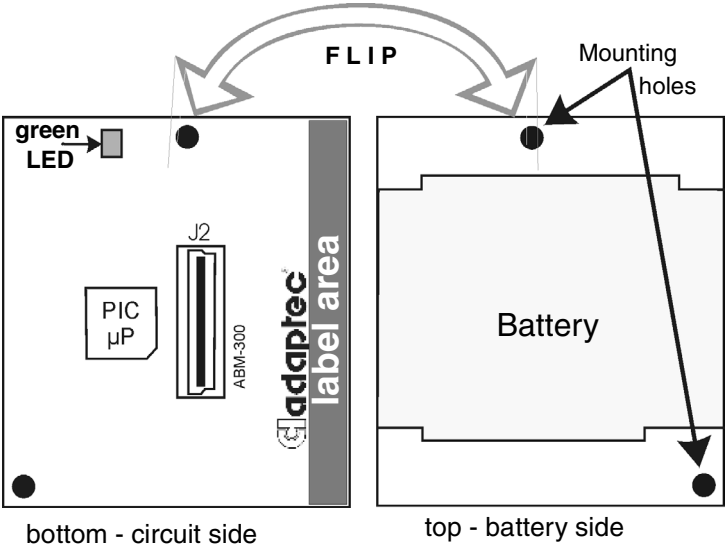
Part	Description
J2	Battery connector to 2120S or 2200S
green LED	Trickle charging indicator

B

Specifications

DC Power Requirements

Voltage (all DC)

2120S/2200S	5V ± .5 V
Ripple and noise	50 mV peak-to-peak maximum

All other voltages used on the controller card are generated from the 5V Vcc line on the controller.

Current Requirements

Adaptec 2120S	2.50 A maximum
Adaptec 2200S	2.72 A maximum

Environmental Specifications

Ambient temperature without battery backup module	0 °C to 50 °C
Relative humidity	10% to 90%, noncondensing
Altitude	up to 3,000 meters

Note: Forced airflow is recommended, but not required.

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